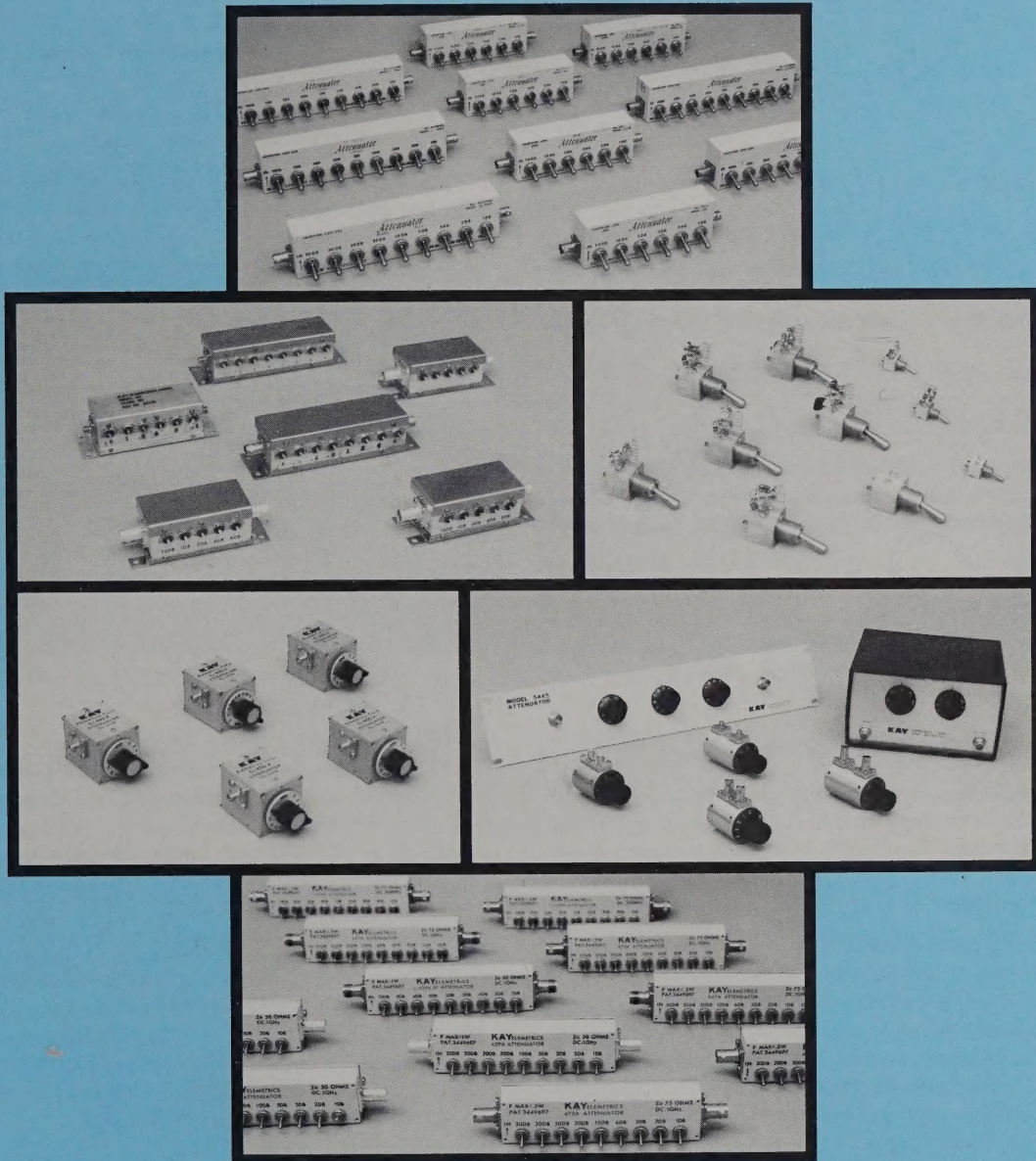


Ron Patterson

Precision Attenuators and Test Equipment



KAY

INTRODUCTION

DESCRIPTION

An attenuator is a device which reduces power in an electrical system by introducing an accurate known loss. In Kay attenuators, this loss is produced by switching in, either manually or remotely, loss networks designed for accurate wide band operation. This power loss, measured in decibels (dB), is the logarithmic ratio of the input to the output power of the attenuator. These attenuators have met rigid environmental tests and their accuracy is traceable to the National Bureau of Standards. Certificates of Compliance and test

data sheets are available on request. Calibration data is available for a minimal charge for each frequency at which data is required. Attenuators have many uses, including serving as accurate standards in the measurement of gain or loss and in extending the sensitivity range of measurement instruments, receivers and amplifiers. Attenuators are also effective for providing isolation or buffering between circuits and reducing the effects of mismatched impedances.

ELECTRICAL SPECIFICATIONS

The quality of an attenuator can be judged by studying its electrical specifications. A brief definition of the specifications of Kay attenuators is given below. Consult the tables for specifications for individual models.

FREQUENCY RANGE

The frequency spectrum over which the attenuator will provide the specified accurate measurements. Kay attenuators are designed for wide band operation and are generally useful beyond these frequencies.

ATTENUATION RANGE

The magnitude of the total attenuation, expressed in decibels, that the attenuator is able to provide. Some Kay models offer as high as 135 dB attenuation range.

ATTENUATION STEPS

The value of the smallest increment measured in dB. Example - 0 to 10 dB steps indicates that the attenuation range is 0 through 10 dB in 1 dB increments or steps. Several models offer increments as small as 0.1 dB.

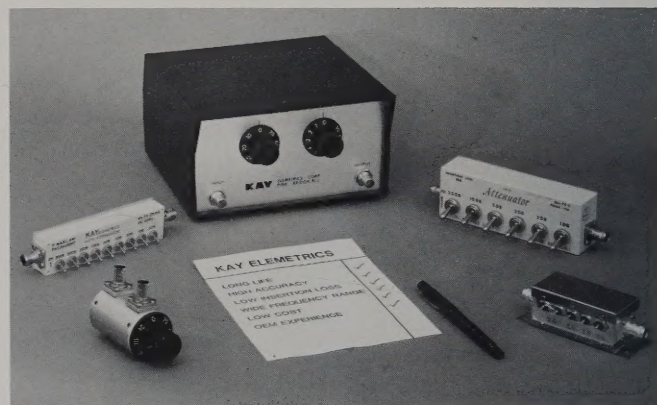
ATTENUATION ACCURACY

The degree of loss is usually specified for specific frequency ranges. It may be stated for individual steps or for total attenuation (all of the steps inserted). Accuracy may be specified in decibels or as a percentage of the attenuation value. In-line attenuator accuracy is usually specified with maximum attenuation inserted. The table below may be used as a guide for determining the accuracy of individual steps.

**TYPICAL PER STEP ACCURACY
FOR KAY ATTENUATORS***

STEP VALUES	FREQUENCY RANGE		
	DC-250 MHz	250-500 MHz	500-1000 MHz
.1-9 dB	±.01 dB	±.05 dB	±.2 dB
1.0-10 dB	±.1 dB	±.3 dB	±.5 dB
20 and 30	±1%	±1.5%	±2%

*EXCEPT SERIES 500 AND 5000.



IMPEDANCE

The impedance of an attenuator is a measure of its input and output match to a given transmission line. The nominal impedance is specified and the degree to which it meets this impedance is indicated by its VSWR specifications. Kay attenuators are available in characteristic impedances of 50, 75, 90 and 600 ohms.

VSWR (RETURN LOSS)

The Voltage Standing Wave Ratio is the measure of the reflected signal at the attenuator connector due to an impedance variance from the specified value. It may be stated as a ratio (VSWR) or in dB (Return Loss). Poor VSWR characteristics result in inferior attenuation accuracies and also add to the insertion loss. Kay attenuators are designed and tested for low VSWR ratios.

INSERTION LOSS

This is the loss of power resulting from inserting an attenuator set to "0" dB or minimum attenuation into a system. Insertion loss must be kept as low and constant as possible over the entire frequency range to assure accurate measurements. The effect of insertion loss is to add additional loss to the nominal attenuation. Kay attenuators are specifically designed to provide low insertion losses through the use of low loss materials and careful individual tuning.

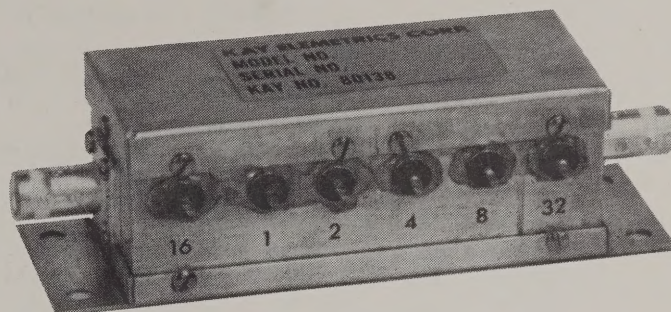
POWER

The maximum input power (watts) that may be applied to the attenuator which will not affect its specifications.

Six-Step Programmable

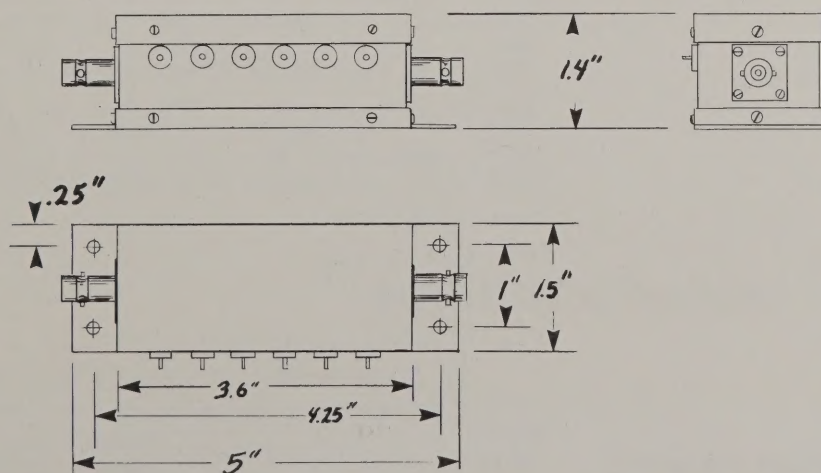
Attenuators

Model 4480 & 4487



Specifications

MODEL	4480	4487
IMPEDANCE:	50 Ω	75 Ω
FREQUENCY RANGE (MHz):	DC-1500	DC-1000
ATTENUATION RANGE (dB):	0-63	0-63
STEPS (dB):	1, 2, 4, 8, 16, 32	1, 2, 4, 8, 16, 32
ACCURACY: DC - 500 MHz	$\pm .5$	$\pm .5$
($\pm$ dB) 500 - 1000 MHz	± 1.0	± 1.0
1000 - 1500 MHz	± 1.5	
VSWR 1: DC - 500 MHz	1.3:1	1.3:1
500 - 1000 MHz	1.4:1	1.4:1
1000 - 1500 MHz	1.4:1	
INSERTION		
LOSS: DC - 500 MHz	2.0	2.0
(dB) 500 - 1000 MHz	2.5	2.5
1000 - 1500 MHz	3.0	
POWER (WATTS):	.5	.5
SWITCH SPEED:	6 MILLISECONDS PER STEP	
SWITCH LIFE:	10,000,000 OPERATIONS	
CONTROL VOLTAGE:	ATTENUATION INSERTED 12 V, 370 MILLIWATS PER STEP (OPTIONAL VOLT: 5, 6, 9, 18, 26.5)	
CONNECTORS:	BNC STANDARD (OPTIONS: SMA, TNC, N)	
WEIGHT:	11 oz, 31 grams	



Optional Logic Adapter

Model 4002:

5 or 6 Bit Input
Control: 5 Volts
@ .038 mA
Power: 12 Volts
200 max.

PRICE LIST

F.O.B. Pine Brook, NJ

Effective March 1, 1984 to August 31, 1984

ATTENUATORS

MODEL	IMPEDANCE	ATTEN. RANGE	STEPS	FREQ. RANGE	UNIT PRICE
-------	-----------	-----------------	-------	----------------	---------------

Programmable Attenuators

4440	50 Ohms	0-130dB	10dB	DC-1.5GHz	\$299*
4447	75 Ohms	0-130dB	10dB	DC-1 GHz	\$299*
4450	50 Ohms	0-127dB	1dB	DC-1.5GHz	\$375*
4457	75 Ohms	0-127dB	1dB	DC-1 GHz	\$375*
4460	50 Ohms	0-31dB	1dB	DC-1.5GHz	\$299*
4467	75 Ohms	0-31dB	1dB	DC-1 GHz	\$299*
1/4450	50 Ohms	0-16.5dB	1dB	DC-1 GHz	\$375*
1/4457	75 Ohms	0-16.5dB	1dB	DC-750MHz	\$375*
4480	50 Ohms	0-63dB	1dB	DC-1.5GHz	\$329*
4487	75 Ohms	0-63dB	1dB	DC-1 GHz	\$329*

*Single piece price. Substantial discount for quantity.

Logic Adapter Model 4000 - For TTL Levels

(For models: 4440, 4447, 4460 and 4467) \$30

Logic Adapter Model 4001 - For TTL Levels

(For models: 4450, 4457, 1/4450 and 1/4457) \$50

OEM Rotary Attenuators

0/400	50 Ohms	1-13dB	Cont. Var.	DC-500MHz	\$150*
0/410	75 Ohms	2-14dB	Cont. Var.	DC-400MHz	\$150*
500A	50 Ohms	0-10dB	1dB	DC-2GHz	\$175*
1/500A	50 Ohms	0-1dB	1dB	DC-1GHz	\$175*
510A	75 Ohms	0-10dB	1dB	DC-1.5GHz	\$175*
1/510A	75 Ohms	0-1dB	1dB	DC-500MHz	\$175*
520	50 Ohms	0-70dB	10dB	DC-2GHz	\$175*
530	75 Ohms	0-70dB	10dB	DC-1.5GHz	\$175*

*Single piece price. Substantial discount for quantity.

Bench Rotary Attenuators

5050	50 Ohms	0-81dB	1dB	DC-1GHz	\$589
5435	RACK MOUNT VERSION OF MODEL 5050				\$589
5075	75 Ohms	0-81dB	1dB	DC-1GHz	\$589
5445	RACK MOUNT VERSION OF MODEL 5075				\$589
5150	50 Ohms	0-80dB	1dB	DC-2GHz	\$419
5436	RACK MOUNT VERSION OF MODEL 5150				\$419
5175	75 Ohms	0-80dB	1dB	DC-1.5GHz	\$419
5446	RACK MOUNT VERSION OF MODEL 5175				\$419

MODEL	IMPEDANCE	ATTEN. RANGE	STEPS	FREQ. RANGE	UNIT PRICE
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Standard Step Attenuators

430B	50 Ohms	10-51dB	1dB	DC-1GHz	\$239
431C	50 Ohms	0-41dB	1dB	DC-1GHz	\$219
432D	50 Ohms	0-101dB	1dB	DC-1GHz	\$265
1/432D	50 Ohms	0-22.1dB	1dB	DC-.5GHz	\$265
441C	75 Ohms	0-41dB	1dB	DC-1GHz	\$219
442D	75 Ohms	0-101dB	1dB	DC-1GHz	\$265
1/442D	75 Ohms	0-22.1dB	1dB	DC-.5GHz	\$265
451B	90 Ohms	0-41dB	1dB	DC-.5GHz	\$229
452	90 Ohms	0-101dB	1dB	DC-.5GHz	\$285
1/452C	90 Ohms	0-22.1dB	1dB	DC-250MHz	\$285

Miniature Attenuators

437A	50 Ohms	0-102.5dB	.5dB	DC-1GHz	\$229
438A	50 Ohms	0-41dB	1dB	DC-1GHz	\$185
439A	50 Ohms	0-101dB	1dB	DC-1.5GHz	\$229
1/439A	50 Ohms	0-22.1dB	1dB	DC-1GHz	\$229
447A	75 Ohms	0-102.5dB	.5dB	DC-1GHz	\$229
449A	75 Ohms	0-101dB	1dB	DC-1GHz	\$229
1/449A	75 Ohms	0-22.1dB	1dB	DC-.5GHz	\$229
460A	50 Ohms	0-132dB	1dB	DC-1GHz	\$229
470A	75 Ohms	0-132dB	1dB	DC-1GHz	\$229

NOTE: Standard BNC connectors are supplied on all models except 437A & 460A (which have TNC). If different connectors are required please consult factory when ordering.

PULSE GENERATORS

Pulse Carrier Generators

5070	Pulse Carrier Generator	\$3,699
5071	Pulse Carrier Generator	\$3,799

Prices and data are subject to change without notice.

ATTENUATORS

DISCOUNT SCHEDULE

FOR QUANTITY PURCHASES

Programmable Attenuators

Model	Quantity	Discount
4440		
4447	10-24	Less 15%
4450	25-49	Less 20%
4457	50-99	Less 25%
4460	100-up	Contact Factory
1/4450		
1/4457		

Standard Step Attenuators

Model	Quantity	Discount
430B		
431C	10-49	Less 5%
432D	50-99	Less 7½%
1/432D	100-up	Contact Factory
441C		
442D		
1/442D		
451B		
452C		
1/452C		

OEM Rotary Attenuators

Model	Quantity	Discount
0/400		
0/410	10-24	Less 15%
500A	25-49	Less 20%
1/500A	50-99	Less 25%
510A	100-up	Contact Factory
1/510A		
520		
530		

Miniature Step Attenuators

Model	Quantity	Discount
437A		
438A	10-49	Less 5%
439A	50-99	Less 7½%
1/439A	100-up	Contact Factory
447A		
449A		
1/449A		
460A		
470A		

Bench Rotary Attenuators

Model	Quantity	Discount
5050		
5435	10-49	Less 5%
5075	50-99	Less 7½%
5445	100-up	Contact Factory
5150		
5436		
5175		
5446		

KAY

Kay Elemetrics Corp
12 Maple Avenue
Pine Brook, NJ 07058 USA

(201) 227-2000
TWX:710-734-4347

ATTENUATORS

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ORDERING INFORMATION

All orders and quotation requests should be sent directly to our main office in Pine Brook, New Jersey. Terms are net 30 days: cash discount 1/2% 10 days. Replacement parts are net 30 days. Shipments are made on open account where credit has been established, against payment in advance when offered, or C.O.D. General instrument prices include operating and maintenance manual(s) describing the equipment. Other accessories necessary for basic operation of the instrument are supplied as specified in this catalog. Prices and specifications are subject to change without notice. Instruments are packed and shipped via UPS unless otherwise requested. There is an additional charge for each option ordered.

PARTS AND SERVICE

Repair and replacement parts are available from the factory Spare Parts Department. All requests for parts should include the instrument model number, serial number, the dB value of the step in

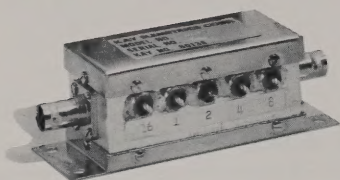
which the part is located (where applicable), and the part value or number. Permission to return equipment should be obtained from the Kay office in Pine Brook, N.J., before equipment is returned. For replacement switches (wired or unwired) or precision resistors, see the maintenance section of the attenuator manual.

WARRANTY

All Kay equipment is warranted to be free from defects in material and workmanship. Our responsibility is limited to repairing or replacing any instrument, or part thereof, for a period of one year when, in our opinion, the repair or replacement is covered by this warranty. Units returned for repair within this time period will receive prompt attention and usually are ready for reshipment within one or two weeks from the received date. Failures due to overload or abuse are not covered by this warranty.

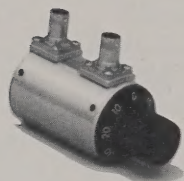
ATTENUATOR SELECTION CHART

MODEL	IMPEDANCE	ATTENUATION RANGE	STEPS	FREQUENCY RANGE	PAGE
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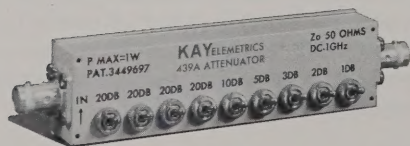
PROGRAMMABLE

1/4450	50Ω	0- 16.5 dB	.1 dB	DC-1000 MHz	7
4440	50Ω	0-130 dB	10 dB	DC-1500 MHz	6
4450	50Ω	0-127 dB	1 dB	DC-1500 MHz	6
4460	50Ω	0- 31 dB	1 dB	DC-1500 MHz	6
1/4447	50Ω	0- 16.5 dB	.1 dB	DC- 750 MHz	7
4447	75Ω	0-130 dB	10 dB	DC-1000 MHz	6
4457	75Ω	0-127 dB	1 dB	DC-1000 MHz	6
4467	75Ω	0- 31 dB	1 dB	DC-1000 MHz	6



ROTARY

1/500	50Ω	0- 1 dB	.1 dB	DC-1000 MHz	8
500	50Ω	0- 10 dB	1 dB	DC-2000 MHz	8
520	50Ω	0- 70 dB	10 dB	DC-2000 MHz	8
5050	50Ω	0- 81 dB	.1 dB	DC-1000 MHz	9
5150	50Ω	0- 80 dB	1 dB	DC-2000 MHz	9
5435	50Ω	0- 81 dB	.1 dB	DC-1000 MHz	9
5436	50Ω	0- 80 dB	1 dB	DC-2000 MHz	9
1/510	75Ω	0- 1 dB	.1 dB	DC- 500 MHz	8
510	75Ω	0- 10 dB	1 dB	DC-1500 MHz	8
530	75Ω	0- 70 dB	10 dB	DC-1500 MHz	8
5075	75Ω	0- 81 dB	.1 dB	DC- 500 MHz	9
5175	75Ω	0- 80 dB	1 dB	DC-1500 MHz	9
5445	75Ω	0- 81 dB	.1 dB	DC- 500 MHz	9
5446	75Ω	0- 80 dB	1 dB	DC-1500 MHz	9



MINIATURE HIGH ACCURACY STEP

1/439	50Ω	0- 22.1 dB	.1 dB	DC-1000 MHz	10
438	50Ω	0- 41 dB	1 dB	DC-1000 MHz	10
439	50Ω	0-101 dB	1 dB	DC-1500 MHz	11
437	50Ω	0-102.5 dB	.5 dB	DC-1000 MHz	10
460	50Ω	0-132 dB	1 dB	DC-1000 MHz	10

MODEL	IMPEDANCE	ATTENUATION RANGE	STEPS	FREQUENCY RANGE	PAGE
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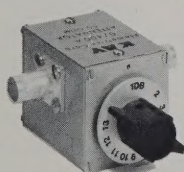
MINIATURE HIGH ACCURACY STEP CON'T

1/449	75 Ω	0- 22.1 dB	.1 dB	DC- 500 MHz	11
448	75 Ω	0- 41 dB	1 dB	DC-1000 MHz	11
449	75 Ω	0-101 dB	1 dB	DC-1000 MHz	11
447	75 Ω	0-102.5 dB	.5 dB	DC-1000 MHz	11
470	75 Ω	0-132 dB	1 dB	DC-1000 MHz	11
1/459	90 Ω	0- 22.1 dB	.1 dB	DC- 250 MHz	11
458	90 Ω	0- 41 dB	1 dB	DC- 500 MHz	11
457	90 Ω	0-102.5 dB	.5 dB	DC- 500 MHz	11
480	90 Ω	0-132 dB	1 dB	DC- 500 MHz	11



HIGH ACCURACY STEP

1/432	50 Ω	0- 22.1 dB	.1 dB	DC- 500 MHz	12
431	50 Ω	0- 41 dB	1 dB	DC-1000 MHz	12
430	50 Ω	10- 51 dB	1 dB	DC-1000 MHz	12
432	50 Ω	0-101 dB	1 dB	DC-1000 MHz	12
1/442	75 Ω	0- 22.1 dB	.1 dB	DC- 500 MHz	12
441	75 Ω	0- 41 dB	1 dB	DC- 500 MHz	13
442	75 Ω	0-101 dB	1 dB	DC-1000 MHz	13
1/452	90 Ω	0- 22.1 dB	.1 dB	DC- 250 MHz	13
451	90 Ω	0- 41 dB	1 dB	DC- 500 MHz	13
452	90 Ω	0-101 dB	1 dB	DC- 500 MHz	13



CONTINUOUSLY VARIABLE

0/400	50 Ω	1- 13 dB		DC- 500 MHz	14
0/410	75 Ω	2- 14 dB		DC- 400 MHz	14

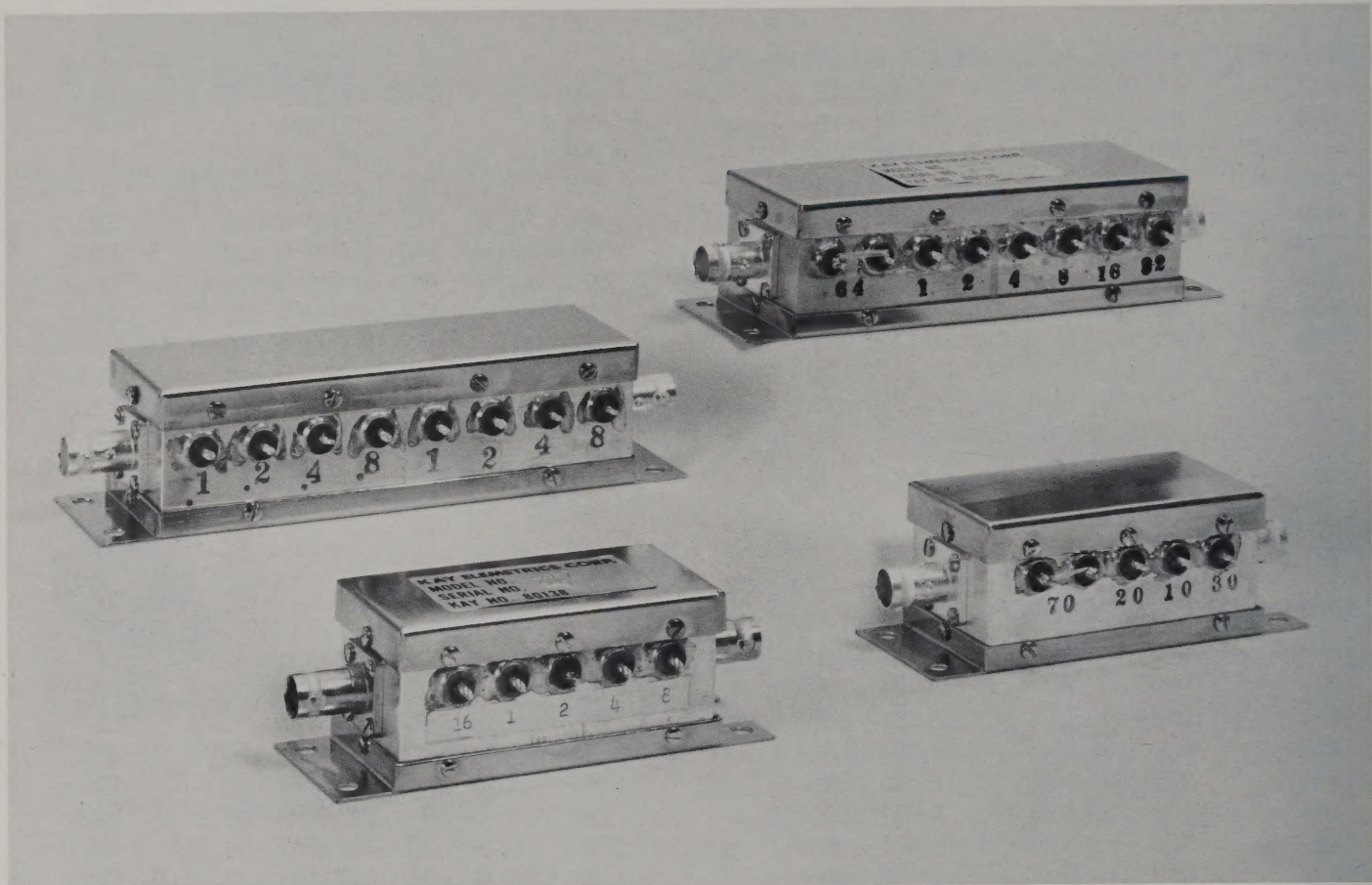


AUDIO

632	50 Ω	0-132 dB	1 dB	DC- 5 MHz	14
665	600 Ω	0-132 dB	1 dB	DC- 1 MHz	14

PROGRAMMABLE ATTENUATORS

- Rapid relay switching
- Easy field service

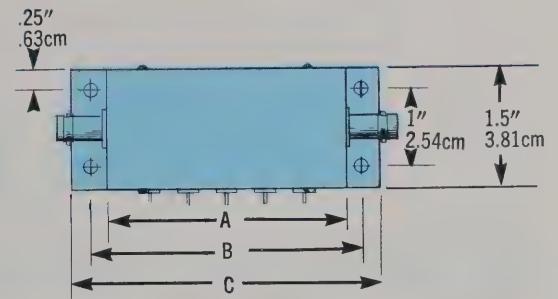


SPECIFICATIONS

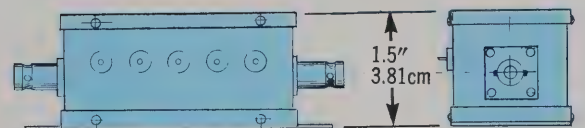
MODEL		4440	4450	4460	4447	4457	4467
IMPEDANCE		50Ω	50Ω	50Ω	75Ω	75Ω	75Ω
FREQUENCY RANGE (MHz)		DC-1500	DC-1500	DC-1500	DC-1000	DC-1000	DC-1000
ATTENUATION RANGE (dB)		0-130	0-127	0-31	0-130	0-127	0-31
STEPS (dB)		10, 20, 30, 70	1, 2, 4, 8, 16, 32, 64	1, 2, 4, 8, 16	10, 20, 30, 70	1, 2, 4, 8, 16, 32, 64	1, 2, 4, 8, 16
ACCURACY:	DC- 500 MHz	1	1	.5	1	1	.5
(± dB)	500-1000 MHz	1.5	1.5	.75	1.5	1.5	.8
	1000-1500 MHz	2.5	3	1			
VSWR	DC- 500 MHz	1.3:1	1.3:1	1.3:1	1.3:1	1.3:1	1.2:1
1:	500-1000 MHz	1.4:1	1.4:1	1.4:1	1.4:1	1.5:1	1.3:1
	1000-1500 MHz	1.4:1	1.5:1	1.4:1			
INSERTION	DC- 500 MHz	1.5	2.5	1.5	1.5	2	1.5
LOSS (dB)	500-1000 MHz	2	3	2	2	3	2
	1000-1500 MHz	2	4	2.5			
POWER (WATTS)		.5	.5	.5	.5	.5	.5
SWITCH SPEED		6 MILLISECONDS PER STEP					
SWITCH LIFE		10,000,000 OPERATIONS					
CONTROL VOLTAGE		ATTENUATION INSERTED: 12V, 370 MILLIWATTS PER STEP (OPTIONAL VOLT 5, 6, 9, 18, 26.5) ATTENUATION OUT: 0 TO 5 VOLT					
CONNECTORS		BNC STANDARD (OPTIONS SMA, TNC, N)					
WEIGHT		12 oz. (.34 Kgs)					

SPECIFICATIONS

MODEL		1/4450	1/4447
IMPEDANCE		50Ω	75Ω
FREQUENCY RANGE (MHz)		DC-1000	DC-750
ATTENUATION RANGE (dB)		0-16.5	0-16.5
STEPS (dB)		.1, .2, .4, .8, 1, 2, 4, 8	.1, .2, .4, .8, 1, 2, 4, 8
ACCURACY: (±dB)	DC- 250 MHz	.1-8 dB±.05	.1-8 dB±.05
	250- 500 MHz	.1-8 dB±.2	.1-8 dB±.2
	500- 750 MHz	1-8 dB±.3	1-8 dB±.3
	500-1000 MHz	.1-8 dB±.2	.1-8 dB±.2
		1-8 dB±.3	1-8 dB±.3
VSWR 1:	DC- 500 MHz	1.3:1	1.3:1
	500- 750 MHz		1.4:1
	500-1000 MHz	1.4:1	
INSERTION LOSS (dB)	DC- 500 MHz	2.5	2.5
	500- 750 MHz		3
	500-1000 MHz	3	
POWER (WATTS)		.5	.5
SWITCH SPEED		6 MILLISECONDS PER STEP	
SWITCH LIFE		10,000,000 OPERATIONS	
CONTROL VOLTAGE		ATTENUATION INSERTED: 12V, 370 MILLIWATTS PER STEP (OPTIONAL VOLT 5, 6, 9, 18, 26.5)	
		ATTENUATION OUT: 0 TO 5 VOLTS	
CONNECTORS		BNC STANDARD (OPTIONS SMA, TNC, N)	
WEIGHT		12 oz. (.34 Kgs.)	



MODEL NO.	A	B	C
4440, 4460,	3"	3.76"	4.16"
4447 & 4467	7.62cm	9.55cm	10.56cm
4450 & 4457	4.87"	5.44"	5.85"
	12.3cm	13.8cm	14.9cm



OPTIONAL LOGIC ADAPTERS

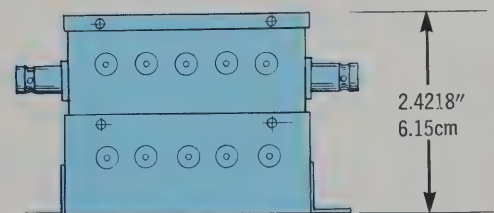
- Provide for attenuator control directly from TTL circuits

Logic adapters, models 4000 and 4001, are designed specifically to interface Kay programmable attenuators directly to TTL circuits. These Logic adapters are especially helpful when the user's logic lines can not handle the heavier load actual 5 volt relays would cause. Each adapter is easily connected to the base of the programmable attenuator. Interconnection to either the 5 or 8 bit drive is through a subminiature connector (10 pin amphenol connector: 17-10150).

AMPHENOL CONNECTOR FOR LOGIC AND POWER INPUTS

ATTENUATOR MODEL	LOGIC ADAPTER MODEL	CONTROL	POWER
4440			
4447	4000	5 Volts	12 Volts DC
4460	4 or 5 Bit input	@ .038 mA	200 max.
4467			
4450			
4457	4001	5 Volts	12 Volts DC
1/4450	7 or 8 Bit input	@ .038 mA	200 max.
1/4457			

Binary Coding: Logic 0 - Minimum attenuation
Logic 1 - Continuous drive of attenuation inserted



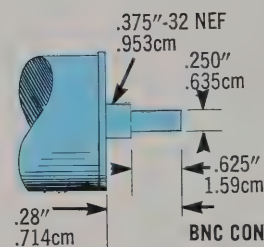
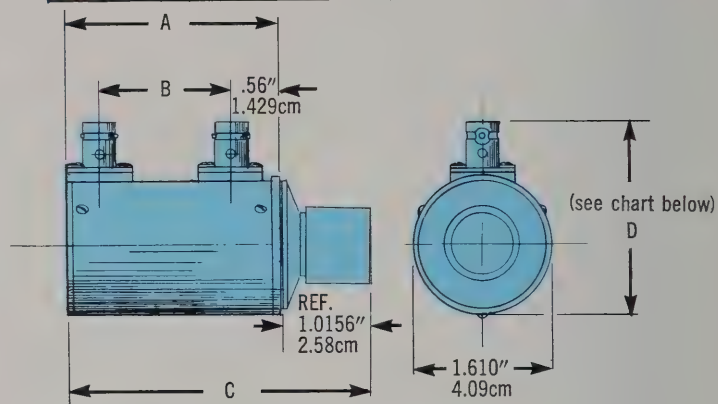
OEM ROTARY ATTENUATORS

- High reliability
- Quality components
- Unique dual contact design



MODEL NO. DIMENSIONS

	A	B	C
1/500, 1/510	1.703"	.75"	2.75"
500, 510	4.3cm	1.91cm	6.99cm
520, 530	2.078"	1.359"	3.359"
	5.87cm	3.45cm	8.53cm



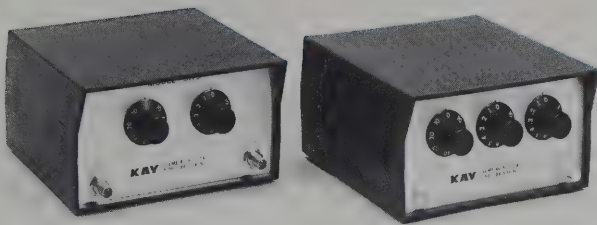
BNC CONNECTOR STANDARD

CONNECTOR TYPE	DIMENSION "D"	
BNC, F, TNC	2.4218"	6.15cm
SMA	2.0781"	5.28cm
AMPHENOL 27-3/27-9	2.0781"	5.28cm
AMPHENOL 27-21	2.1718"	5.52cm

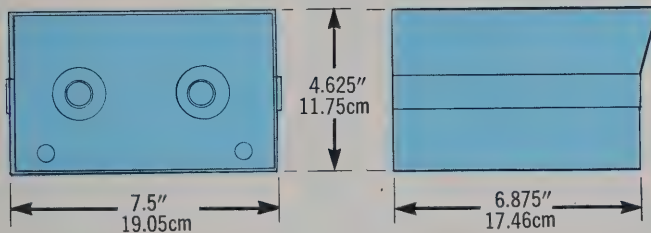
SPECIFICATIONS

MODEL	1/500	500	520	1/510	510	530
IMPEDANCE	50Ω	50Ω	50Ω	75Ω	75Ω	75Ω
FREQUENCY RANGE (MHz)	DC-1000	DC-2000	DC-2000	DC-500	DC-1500	DC-1500
ATTENUATION RANGE (dB)	0-1	0-10	0-70	0-1	0-10	0-70
STEPS (dB)	.1	1	10	.1	1	10
ACCURACY: (±dB)						
DC- 250 MHz	.025	.1	.1+1%	.025	.1	.1+1%
250- 500 MHz	.025	.1	.1+1%	.025	.1	.1+1%
500-1000 MHz	.025+2%	.3	.2+1%		.3	.2+1%
1000-1500 MHz					.3	.2+2%
1000-2000 MHz		.5	.2+2%			
VSWR 1:						
DC- 250 MHz	1.1	1.1	1.1	1.1	1.1	1.1
250- 500 MHz	1.1	1.1	1.15	1.2	1.15	1.15
500-1000 MHz	1.2	1.2	1.2		1.2	1.2
1000-1500 MHz					1.3	1.3
1000-2000 MHz		1.3	1.3			
INSERTION LOSS (dB)						
DC- 250 MHz	.1	.1	.1	.1	.1	.1
250- 500 MHz	.1	.1	.1	.1	.1	.1
500-1000 MHz	.2	.2	.2		.2	.2
1000-1500 MHz					.3	.3
1000-2000 MHz		.3	.3			
POWER (WATTS)	1	1	.5	1	1	.5
STANDARD CONNECTORS	BNC	BNC	BNC	BNC	BNC	BNC
WEIGHT Lbs.	7 oz.	7 oz.	9 oz.	7 oz.	7 oz.	9 oz.
Kgs.	.2	.2	.25	.2	.2	.25

ROTARY BENCH ATTENUATORS



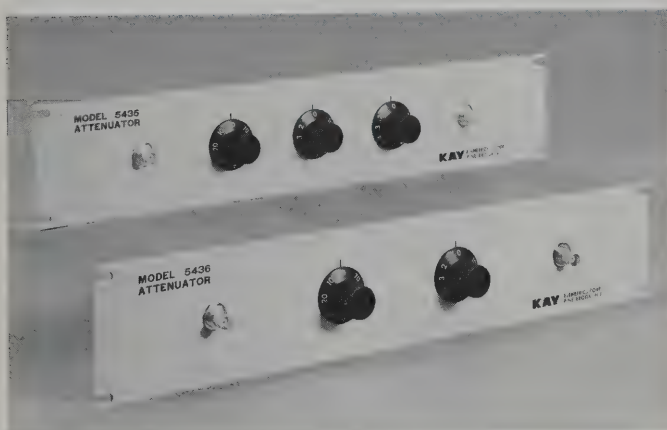
BNC TYPE CONNECTORS STANDARD
OTHER TYPES OPTIONAL-SPECIFY ON ORDER



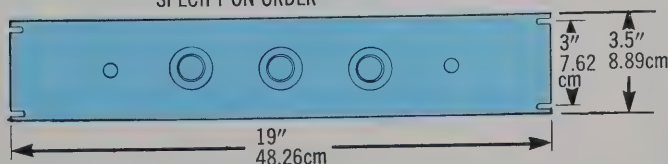
SPECIFICATIONS

MODEL	5050	5150	5075	5175
IMPEDANCE	50Ω	50Ω	75Ω	75Ω
FREQUENCY RANGE (MHz)	DC-1000	DC-2000	DC-500	DC-1500
ATTENUATION RANGE (dB)	0-81	0-80	0-81	0-80
STEPS (dB)	.1	1	.1	1
ACCURACY (±dB)	DC- 250 MHz	.2+1%	.2+1%	.2+1%
	250- 500 MHz	.3+1%	.3+1%	.3+1%
	500-1000 MHz	.5+1%	.5+1%	.5+1%
	1000-1500 MHz			.7+2%
	1000-2000 MHz		.7+2%	
VSWR 1:	DC- 250 MHz	1.1	1.1	1.3
	250- 500 MHz	1.3	1.2	1.5
	500-1000 MHz	1.5	1.4	1.5
	1000-1500 MHz			1.5
	1000-2000 MHz		1.5	
INSERTION LOSS (dB)	DC- 250 MHz	.3	.2	.3
	250- 500 MHz	.4	.3	.5
	500-1000 MHz	.8	.6	.5
	1000-1500 MHz			.8
	1000-2000 MHz		.8	
POWER (WATTS)	.5	.5	.5	.5
STANDARD CONNECTORS	BNC	BNC	BNC	BNC
WEIGHT	Lbs.	3	2.5	3
	Kgs.	1.36	1.13	1.36

ROTARY RACK MOUNT ATTENUATORS



R.F. CONNECTORS ON FRONT PANEL
OPTIONAL ON RACK MOUNT UNITS
SPECIFY ON ORDER

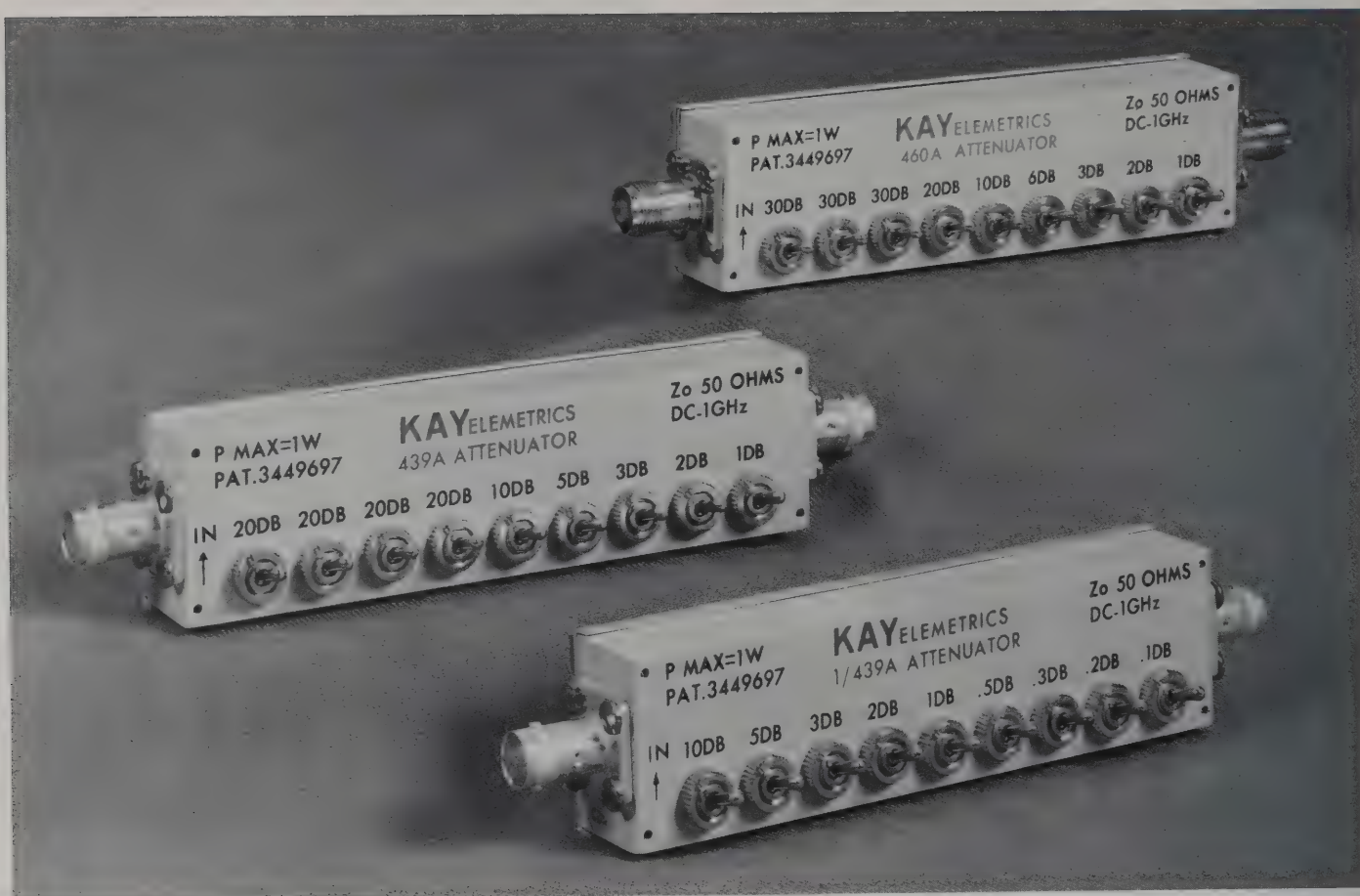


SPECIFICATIONS

MODEL	5435	5436	5445	5446
IMPEDANCE	50Ω	50Ω	75Ω	75Ω
FREQUENCY RANGE (MHz)	DC-1000	DC-2000	DC-500	DC-1500
ATTENUATION RANGE (dB)	0-81	0-80	0-81	0-80
STEPS (dB)	.1	1	.1	1
ACCURACY: (±dB)	DC- 250 MHz	.2+1%	.2+1%	.2+1%
	250- 500 MHz	.3+1%	.3+1%	.3+1%
	500-1000 MHz	.5+1%	.5+1%	.5+1%
	1000-1500 MHz			.7+2%
	1000-2000 MHz		.7+2%	
VSMR 1:	DC- 250 MHz	1.1	1.1	1.3
	250- 500 MHz	1.3	1.2	1.5
	500-1000 MHz	1.5	1.4	1.5
	1000-1500 MHz			1.5
	1000-2000 MHz		1.5	
INSERTION LOSS	DC- 250 MHz	.3	.2	.3
	250- 500 MHz	.4	.3	.5
	500-1000 MHz	.8	.6	.5
	1000-1500 MHz			.8
	1000-2000 MHz		.8	
POWER (WATTS)	.5	.5	.5	.5
STANDARD CONNECTORS	BNC	BNC	BNC	BNC
WEIGHT	Lbs.	3	2.5	3
	Kgs.	1.36	1.13	1.36

MINIATURE HIGH ACCURACY STEP ATTENUATORS

- Instrument panel mount
- Up to 132 dB attenuation in a compact design
- Very low insertion loss to 1 GHz



SPECIFICATIONS

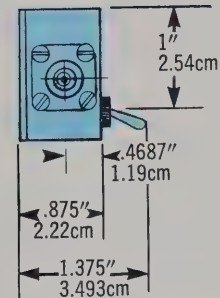
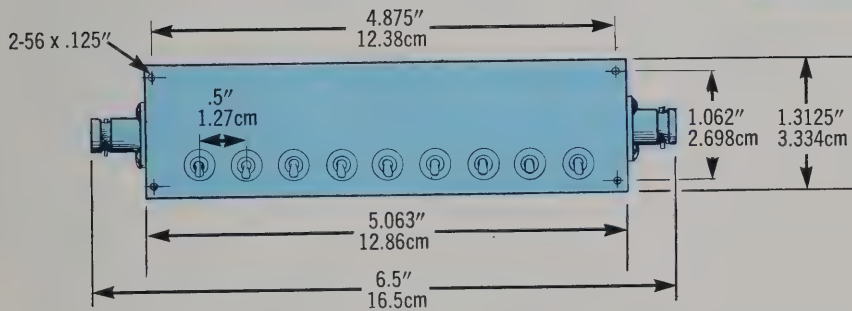
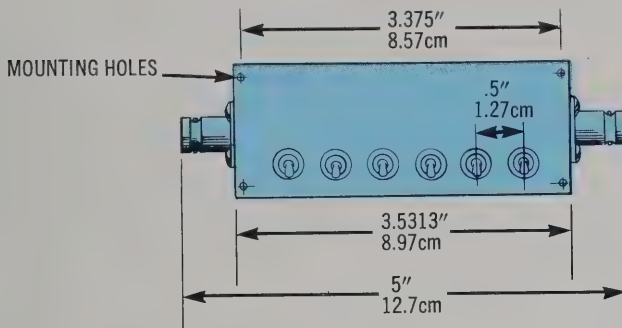
MODEL		1/439	438	437	460
IMPEDANCE		50Ω	50Ω	50Ω	50Ω
FREQUENCY RANGE (MHz)		DC-1000	DC-1000	DC-1000	DC-1000
ATTENUATION RANGE (dB)		0-22.1	0-41	0-102.5	0-132
STEPS (dB)		.1, .2, .3, .5, 1, 2, 3, 5, 10	1, 2, 3, 5, 10, 20	.5, 1, 2, 3, 6, 10, 20, 30, 30	1, 2, 3, 6, 10, 20, 30, 30, 30
ACCURACY:	DC- 250 MHz	0-.5 dB:	.5	.5	.5
(±dB)	250- 500 MHz	±.05/Step	1	1	1
	500-1000 MHz	1-10 dB:			
VSWR	DC- 250 MHz	±.3/Step	1.5	1.5	1.5
1:	250- 500 MHz	1.2	1.2	1.2	1.2
	500-1000 MHz	1.2	1.2	1.2	1.2
INSERTION	DC- 250 MHz	1.4	1.4	1.4	1.4
LOSS (dB)	250- 500 MHz	.1	.1	.1	.1
	500-1000 MHz	.2	.2	.2	.2
POWER (WATTS)		.5	.5	.5	.5
STANDARD CONNECTORS		1	1	1	1
WEIGHT Lbs.		BNC	BNC	TNC	TNC
Kgs.		8 oz.	6 oz.	8 oz.	8 oz.
		.23	.17	.23	.23

OPTIONS

MOUNTING HOLES	KS
19" RACK MOUNT PANEL	RM
19" RACK MOUNT w/PANEL	
MOUNTED CONNECTORS	RMA
SWITCH HANDLE BOOTS	Specify

OPTIONAL CONNECTOR TYPES

50 OHMS: TNC, SMA	Specify
75 & 90 OHMS: F, TNC	Specify



MINIATURE ATTENUATOR WITH EXTENDED FREQUENCY RANGE

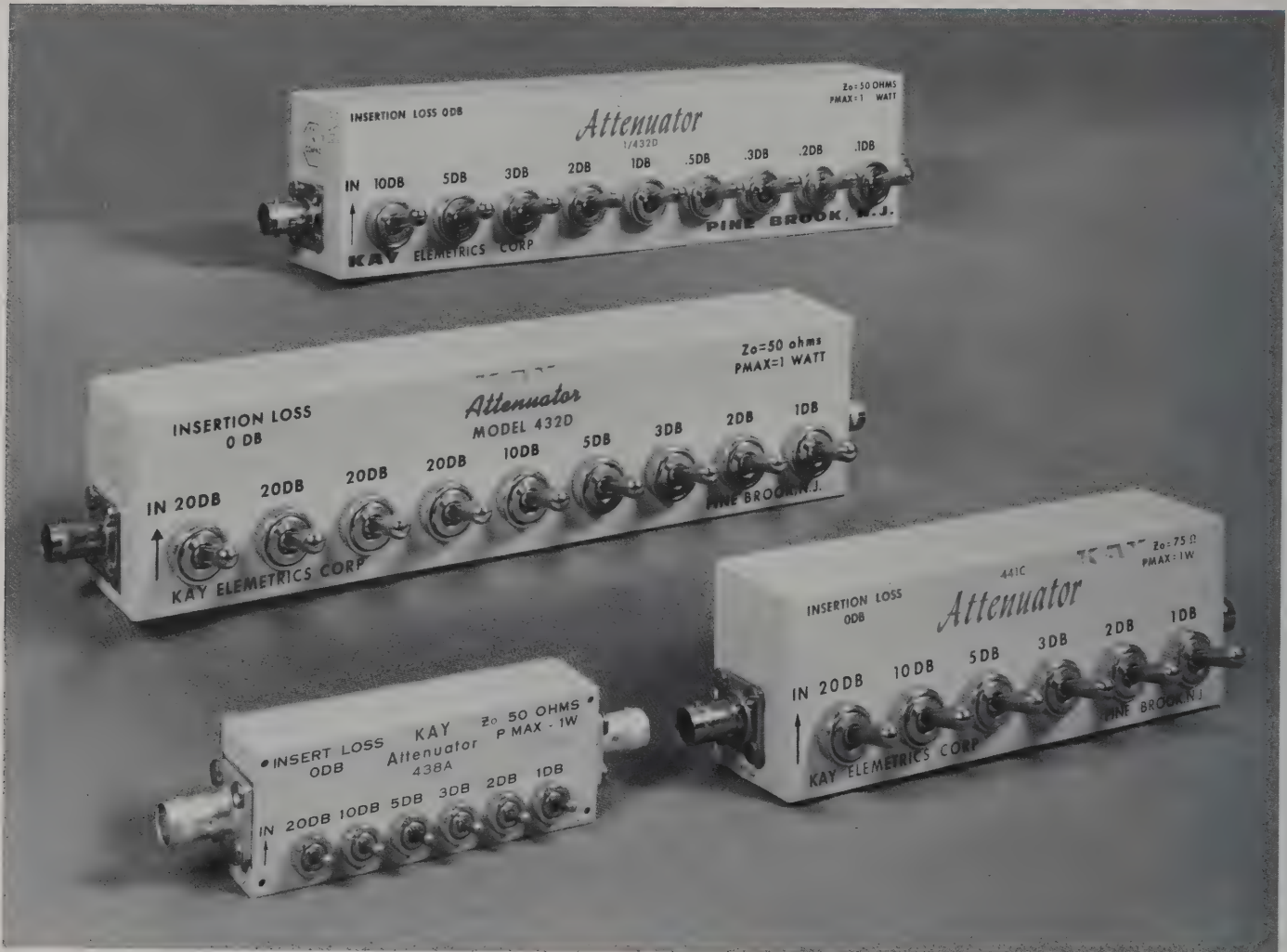
MODEL	439
IMPEDANCE	50Ω
FREQUENCY RANGE (MHz)	DC-1500
ATTENUATION RANGE (dB)	0-101
STEPS (dB)	1, 2, 3, 5, 10, 20, 20, 20, 20
ACCURACY: (±dB)	DC- 250 MHz 1-10dB: ± .1dB/Step 20dB: ± .2dB/Step 250- 500 MHz 1-10dB: ± .3dB/Step 20dB: ± .4dB/Step 500-1000 MHz 1-10dB: ± .3dB/Step 20dB: ± .5dB/Step 1000-1500 MHz 1-10dB: ± .4dB/Step 20dB: ± .7dB/Step
VSWR	DC- 500 MHz 1.2 500-1500 MHz 1.4
INSERTION LOSS (dB)	DC- 250 MHz .1 250- 500 MHz .2 500-1000 MHz .5 1000-1500 MHz .8
POWER (WATTS)	1
STANDARD CONNECTORS	BNC
WEIGHT Lbs.	8 oz.
Kgs.	.23

SPECIFICATIONS

MODEL	1/449	448	449	447	470
IMPEDANCE	75Ω	75Ω	75Ω	75Ω	75Ω
FREQUENCY RANGE (MHz)	DC-500	DC-1000	DC-1000	DC-1000	DC-1000
ATTENUATION RANGE (dB)	0-22.1	0-41	0-101	0-102.5	0-132
STEPS (dB)	.1, .2, .3, .5, 1, 2, 3, 5, 10	1, 2, 3, 5, 10, 20	1, 2, 3, 5, 10, 20, 20, 20, 20	.5, 1, 2, 3, 6, 10, 20, 30, 30	1, 2, 3, 6, 10, 20, 30, 30
ACCURACY: (±dB)	DC- 250 MHz 0-.05 dB 250- 500 MHz ±.05/Step 500-1000 MHz 1-10 dB: ±.3/Step	.5 1 1	1 1.5 2	1 1.5 2	1 1.5 2
VSWR	DC- 250 MHz 1.2 250- 500 MHz 1.2 500-1000 MHz 1.4	1.2 1.2 1.4	1.2 1.2 1.4	1.2 1.2 1.4	1.2 1.2 1.4
INSERTION LOSS (dB)	DC- 250 MHz .1 250- 500 MHz .2 500-1000 MHz .5	.1 .2 .4 .5	.1 .2 .4 .5	.1 .2 .4 .5	.1 .2 .4 .5
POWER (WATTS)	1	.5	.5	.5	.5
STANDARD CONNECTORS	BNC	BNC	BNC	BNC	BNC
WEIGHT Lbs.	8 oz.	6 oz.	8 oz.	8 oz.	8 oz.
Kgs.	.23	.17	.23	.23	.23

HIGH ACCURACY STEP ATTENUATORS

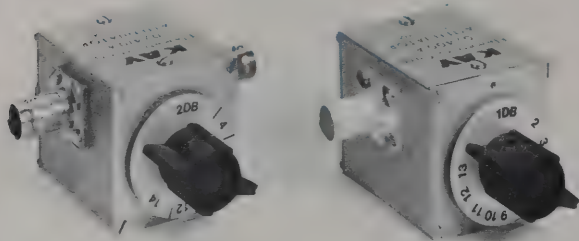
- Precision lab and engineering standards
- Research and development
- Test sets



SPECIFICATIONS

MODEL	1/432	431	430	432	1/442
IMPEDANCE	50Ω	50Ω	50Ω	50Ω	75Ω
FREQUENCY RANGE (MHz)	DC-500	DC-1000	DC-1000	DC-1000	DC-500
ATTENUATION RANGE (dB)	0-22.1	0-41	10-51	0-101	0-22.1
STEPS (dB)	.1, .2, .3, .5, 1, 2, 3, 5, 10	1, 2, 3, 5, 10, 20	1, 2, 3, 5, 10, 20	1, 2, 3, 5, 10, 20, 20, 20, 20	.1, .2, .3, .5, 1, 2, 3, 5, 10
ACCURACY: (±dB)	DC- 250 MHz 0-.5dB ±.05/Step 250- 500 MHz 1-10dB 500-1000 MHz ±.3/Step	.5	.5	.6	5%
VSWR	DC- 250 MHz 1.2 250- 500 MHz 1.2 500-1000 MHz 1.4	1.2 1.4 1.4	1.2 1.4 1.4	1.2 1.3 1.4	1.2 1.4
INSERTION LOSS (dB)	DC- 250 MHz .1 250- 500 MHz .2 500-1000 MHz .5	.1 .2 .5	10.1 10.2 10.5	.1 .3 .7	.1 .2
POWER (WATTS)	1	1	1	1	1
STANDARD CONNECTORS	BNC	BNC	BNC	BNC	BNC
WEIGHT Lbs.	3	2	2	3	3
Kgs.	1.36	.9	.9	1.36	1.36

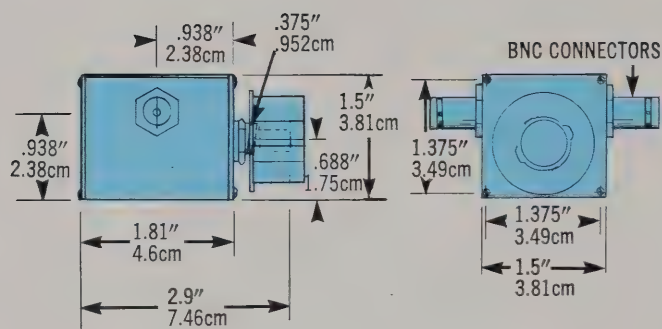
CONTINUOUSLY VARIABLE ATTENUATORS



- Low cost
- Wide band

SPECIFICATIONS

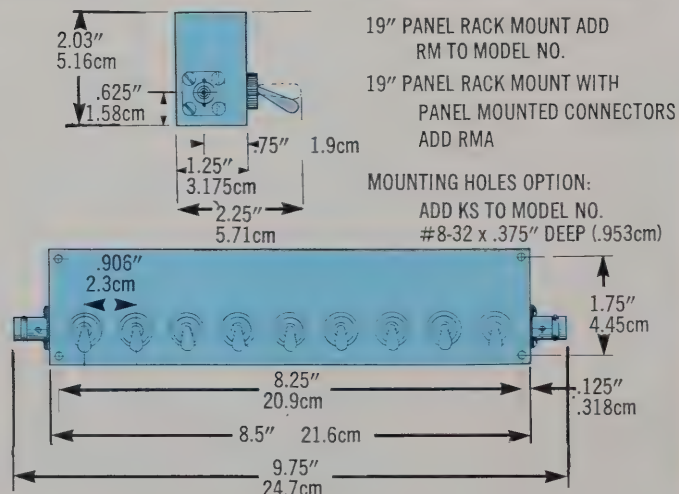
MODEL	0/400	0/410
IMPEDANCE	50Ω	75Ω
FREQUENCY	DC-500 MHz	DC-400 MHz
ATTENUATION	1-13 dB	2-14 dB
CONTROL	ROTARY, CONT. VAR.	ROTARY, CONT. VAR.
ACCURACY ($\pm$ dB)	.3 dB	.3 dB
FLATNESS	$\pm$.2 dB	$\pm$.2 dB
INSERTION LOSS	1 dB	2 dB
MAX. VSWR 1:	1.3	1.35
POWER (WATTS)	1	1
CONNECTORS	BNC	BNC
WEIGHT Lbs.	4 oz.	4 oz.
Kgs.	.11	.11



AUDIO ATTENUATORS



- Sonic and ultrasonic applications



SPECIFICATIONS

MODEL	632	665
IMPEDANCE	50Ω	600Ω
FREQUENCY RANGE (MHz)	DC-5	DC-1
ATTENUATION RANGE (dB)	0-132	0-132
STEPS (dB)	1, 2, 3, 6, 10, 20, 30, 30, 30	1, 2, 3, 6, 10, 20, 30, 30, 30
ACCURACY OVERALL, ($\pm$ dB)	.8	.8
VSWR 1:	1.1	1.1
INSERTION LOSS (dB)	.1	.1
POWER (WATTS)	1	1
STANDARD CONNECTORS	BNC	BNC
WEIGHT Lbs.	3	3
Kgs.	1.36	1.36

CUSTOM DESIGNED ATTENUATORS

Using extensive design capabilities, Kay Elemetrics Corp has designed over 400 special attenuators for the end user and OEM applications. Kay will custom design an attenuator to meet your specific needs. A variety of connectors and different types of housing are described with each group of attenuator.

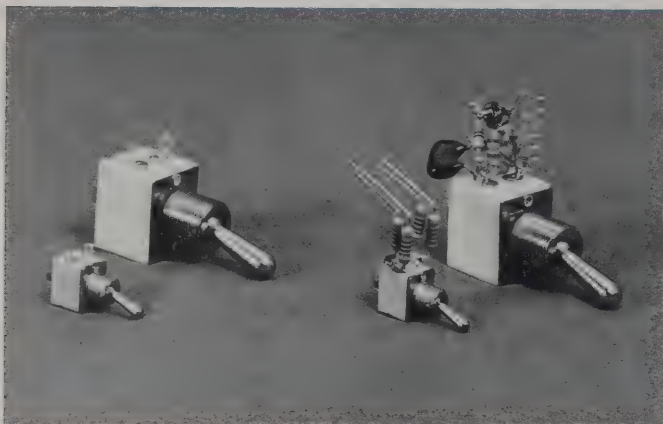
Custom attenuators can include changes in one or all of the specifications listed below.

- Impedance
- Frequency Range
- Attenuation Range
- Total Number of Steps
- Values Per Step
- Power (watts)
- Connectors or Type of Housing
- Dimensions
- Operation Voltage (for programmables)
- Switching Speed

To get a price quote on a custom attenuator simply contact the factory and a sale engineer will discuss your specific requirements.

CONVERSION CHART dB to Voltage or Power Ratio

Voltage Ratio	Power Ratio	-dB+	Voltage Ratio	Power Ratio	Voltage Ratio	Power Ratio	-dB+	Voltage Ratio	Power Ratio	Voltage Ratio	Power Ratio	-dB+	Voltage Ratio	Power Ratio
1.000	1.000	0	1.000	1.000	.631	.398	4.0	1.585	2.512	.398	.159	8.0	2.512	6.310
.989	.977	.1	1.012	1.023	.624	.389	4.1	1.603	2.570	.394	.155	8.1	2.541	6.457
.977	.955	.2	1.023	1.047	.617	.380	4.2	1.622	2.630	.389	.151	8.2	2.570	6.607
.966	.933	.3	1.035	1.072	.610	.372	4.3	1.641	2.692	.385	.148	8.3	2.600	6.761
.955	.912	.4	1.047	1.096	.603	.363	4.4	1.660	2.754	.380	.145	8.4	2.630	6.918
.944	.891	.5	1.059	1.122	.596	.355	4.5	1.679	2.818	.376	.141	8.5	2.661	7.079
.933	.871	.6	1.072	1.148	.589	.347	4.6	1.698	2.884	.372	.138	8.6	2.692	7.244
.923	.851	.7	1.084	1.175	.582	.339	4.7	1.718	2.951	.367	.135	8.7	2.723	7.413
.912	.832	.8	1.096	1.202	.575	.331	4.8	1.738	3.020	.363	.132	8.8	2.754	7.586
.902	.813	.9	1.109	1.230	.569	.324	4.9	1.758	3.090	.359	.129	8.9	2.786	7.762
.891	.794	1.0	1.122	1.259	.562	.316	5.0	1.778	3.162	.355	.126	9.0	2.818	7.943
.881	.776	1.1	1.135	1.288	.556	.309	5.1	1.799	3.236	.351	.123	9.1	2.851	8.128
.871	.759	1.2	1.148	1.318	.550	.302	5.2	1.820	3.311	.347	.120	9.2	2.884	8.318
.861	.741	1.3	1.161	1.349	.543	.295	5.3	1.841	3.388	.343	.118	9.3	2.917	8.511
.851	.724	1.4	1.175	1.380	.537	.288	5.4	1.862	3.467	.339	.115	9.4	2.951	8.710
.841	.708	1.5	1.189	1.413	.531	.282	5.5	1.884	3.548	.335	.112	9.5	2.985	8.913
.832	.692	1.6	1.202	1.445	.525	.275	5.6	1.905	3.631	.331	.110	9.6	3.020	9.120
.822	.676	1.7	1.216	1.479	.519	.269	5.7	1.928	3.715	.327	.107	9.7	3.055	9.333
.813	.661	1.8	1.230	1.514	.513	.263	5.8	1.950	3.802	.324	.105	9.8	3.090	9.550
.804	.646	1.9	1.245	1.549	.507	.257	5.9	1.972	3.890	.320	.102	9.9	3.126	9.772
.794	.631	2.0	1.259	1.585	.501	.251	6.0	1.995	3.981					
.785	.617	2.1	1.274	1.622	.496	.246	6.1	2.018	4.074					
.776	.603	2.2	1.288	1.660	.490	.240	6.2	2.042	4.169					
.767	.589	2.3	1.303	1.698	.484	.234	6.3	2.065	4.266					
.759	.575	2.4	1.318	1.738	.479	.229	6.4	2.089	4.365					
.750	.562	2.5	1.334	1.778	.473	.224	6.5	2.113	4.467	.316	.100	10.0	3.162	10.00
.741	.550	2.6	1.349	1.820	.468	.219	6.6	2.138	4.571	.100	.0100	20.0	10.000	100.00
.733	.537	2.7	1.365	1.862	.462	.214	6.7	2.163	4.677			10-3	30	103
.724	.525	2.8	1.380	1.905	.457	.209	6.8	2.188	4.786	10-2	10-4	40	102	104
.716	.513	2.9	1.396	1.950	.452	.204	6.9	2.213	4.898		10-5	50		105
.708	.501	3.0	1.413	1.995	.447	.200	7.0	2.239	5.012	10-3	10-6	60	103	106
.700	.490	3.1	1.429	2.042	.442	.195	7.1	2.265	5.129		10-7	70		107
.692	.479	3.2	1.445	2.089	.437	.191	7.2	2.291	5.248	10-4	10-8	80	104	108
.684	.468	3.3	1.462	2.138	.432	.186	7.3	2.317	5.370		10-9	90		109
.676	.457	3.4	1.479	2.188	.427	.182	7.4	2.344	5.495	10-5	10-10	100	105	1010
.668	.447	3.5	1.496	2.239	.422	.178	7.5	2.371	5.623		10-11	110		1011
.661	.437	3.6	1.514	2.291	.417	.174	7.6	2.399	5.754	10-6	10-12	120	106	1012
.653	.427	3.7	1.531	2.344	.412	.170	7.7	2.427	5.888					
.646	.417	3.8	1.549	2.399	.407	.166	7.8	2.455	6.026					
.638	.407	3.9	1.567	2.455	.403	.162	7.9	2.483	6.166					



- Standard and miniature size
- Molded teflon body
- Solid silver contacts, gold plated
- Low inductance, capacitance and resistance
- DC to 1,000 MHz and up
- Wired or unwired

Kay Mega-Switches, time proven in the widely-used Kay RF Attenuators, are now available as commercial components. They are precision manufactured with teflon body and solid silver contacts and provide highly stable operation over wide ranges of temperature and humidity.

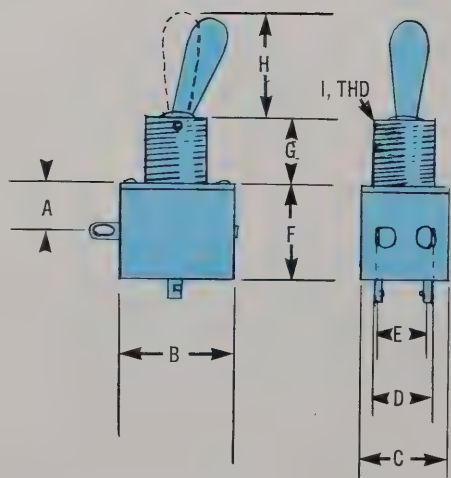
Their unique physical and electrical characteristics: small size, low internal resistance, inductance, and capacitance permit them to be used freely in critical R-F switching applications and for high-current carrying requirements (10 amperes at 117 volts, 60 Hz, standard size).

Low shunt capacitance and low series inductance also enable the Mega-Switches to be used for narrow pulse switching. The wear-resistant solid coin-silver contacts with a thick 50 millionth of gold plating provide positive electrical connection after more than 400,000 switching operations. The shunt capacitance between the switch arms is approximately 0.15 pico farads, and between the open contacts and switch arm is approximately 0.1 pico farads.

INSERTION LOSS

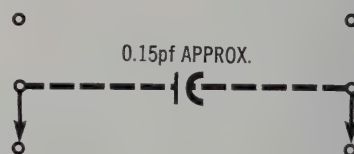
FREQUENCY RANGE	STANDARD (dB)	MINIATURE (dB)
DC - 250 MHz	.01	.01
250 - 500 MHz	.03	.02
500 -1000 MHz	.07	.05

MODEL	DESCRIPTION
254 TX	STANDARD DPDT
254 T	STANDARD w/SHORTING STRAP
254 TXN	STANDARD DPDT NYLON HANDLE
254 TM	MINIATURE w/SHORTING STRAP
254 TXM	MINIATURE DPDT

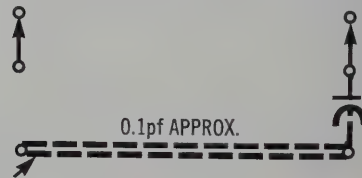


DIM.	STANDARD	MINIATURE
A	.675" (1.71cm)	.332" (.843cm)
B	.785" (1.99cm)	.390" (.99cm)
C	.630" (1.60cm)	.312" (.79cm)
D	.450" (1.14cm)	.300" (.76cm)
E	.344" (.87cm)	.225" (.57cm)
F	.312" (.79cm)	.156" (.396cm)
G	.468" (1.19cm)	.234" (.59cm)
H	.687" (1.74cm)	.375" (.95cm)
I	.496-32THD	.25-32 THD

CAPACITANCE BETWEEN SWITCH ARMS



CAPACITANCE BETWEEN OPEN CONTACT AND SWITCH ARM



AVAILABLE WITH INTERNAL SHORTING STRAP

PULSED CARRIER GENERATORS



- Wide frequency range
- High off levels

The model 5070B and 5071B are solid-state pulsed RF generators featuring fast rise and decay times, and flat tops. They combine CW oscillators and pulse generators along with diode switching action to provide the pulsed RF output. These instruments also function as CW signal generators over their bands. The 5070B provides positive and negative video pulses.

The 5070B covers a range from 10-120 MHz in five bands, with a wide range of pulse widths and pulse repetition rates. The RF output is held at the same level during both pulsed RF and CW functions. The carrier pulses are flat and the rise and decay times are less than

10ns. Off levels are greater than 70-85 dB over the full range.

The 5071B provides the fine pulse and RF characteristics of the 5070B from 10-250 MHz. In addition to its wide range, this instrument features off levels of better than 95 dB up to 100 MHz, and provides an additional sync pulse. Other specifications, such as excellent rise, decay, and flatness, are maintained.

Both units may be externally modulated (i.e., both repetition rate and pulse width externally controlled) and externally triggered at pulse rates up to and exceeding their own pulse rates.

SPECIFICATIONS

MODEL
CARRIER FREQUENCY
DIAL ACCURACY
CARRIER OFF-LEVEL

PULSE RATE
PULSE WIDTH
RISE AND
DECAY: PULSED R.F.
VIDEO PULSE
SYNC OUTPUT: #1

#2

OUTPUT R.F.
AMPLITUDE VIDEO
EXT TRIGGER INPUT
EXT MODULATION INPUT
ATTENUATOR
DIMENSIONS

WEIGHT

5070B

10-120 MHz

1%

85 dB to 30 MHz

80 dB to 70 MHz

70 dB to 120 MHz

50-5000 pps

100 ns-100 μ s

10 ns

20 ns

+ 1 volt into 50 ohms, 25 n sec. rise time
precedes output pulse by approx. 50 n sec.

.5 vrms into 50 ohms

$\pm$ 3 volts into 50 ohms

- 2 volts pulse required

+ 2 volts pulse required

101 dB in 1 dB steps

19.5" x 8" x 13"

(50 cm x 20 cm x 31.5 cm)

29 lbs (12 kgs)

5071B

10-250MHz

1%

95 dB to 100 MHz

90 dB to 150 MHz

76 dB to 250 MHz

50-5000 pps

100 ns-100 μ s

10 ns

+ 4 volts into 50 ohms, 20 n sec. rise time,
50 n sec. wide precedes sync pulse #2 by
variable 250 n sec. to 100 μ sec.

+ .5 volt into 50 ohms,

30 n sec. rise & decay, 120 n sec.
wide precedes RF pulse by approx. 70 n sec.

.5 vrms into 50 ohms

$\pm$ 3 volts into 50 ohms

- 2 volts pulse required

+ 2 volts pulse required

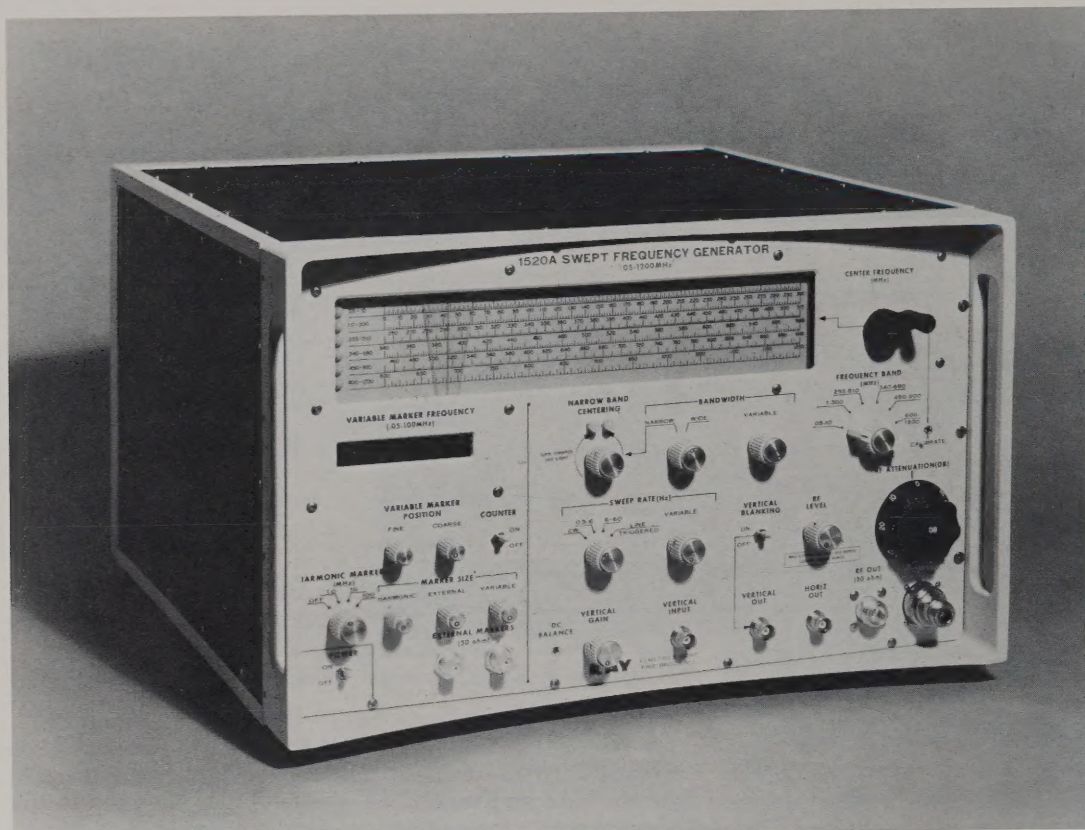
102.5 dB in .5 dB steps

19.5" x 8" x 13"

(50 cm x 20 cm x 31.5 cm)

29 lbs (12 kgs)

SWEEP FREQUENCY GENERATOR



- High quality
- Full function

SPECIFICATIONS

FREQUENCY RANGE: 50 kHz - 1200 MHz

FREQUENCY BANDS: 50 kHz-10 MHz, 10 MHz-300 MHz, 225 MHz-510 MHz, 340 MHz-680 MHz, 450 MHz-900 MHz, 600 MHz-1200 MHz

FREQUENCY ACCURACY:

50 kHz-10 MHz: ± 1 MHz Dial Accuracy

1 MHz-100 MHz: ± 3.0 MHz Dial Accuracy

100 MHz-1200 MHz: $\pm 2\%$ Dial Accuracy

50 kHz-100 MHz: $\pm .02\%$ Counter Accuracy

R.F. OUTPUT: 50 kHz-300 MHz, .5 V RMS into 50 ohms

255 MHz-1200 MHz, 1.0 V RMS into 50 ohms

OUTPUT FLATNESS: 50 kHz-800 MHz: ± 0.5 dB

(MAX. SWEEP WIDTH): 800 MHz-1200 MHz: ± 1.0 dB

OUTPUT IMPEDANCE: 50 ohms

FREQUENCY LINEARITY: 5% Full Sweep

SPURIOUS OUTPUT: > 20 dB below fundamental output

HARMONIC DISTORTION: > 30 dB below fundamental output

R.F. ATTENUATION: 0-70 dB in 10 dB steps 0-10 dB vernier

ATTENUATION ACCURACY: ± 1 dB

HORIZONTAL OUTPUT: 5V p/p sawtooth at the sweep repetition rate.

SWEEP RATE: 0.5-6 Hz and 6-60 Hz (variable) Line triggered: CW

EXTERNAL MARKER INPUT: Provision for two at any frequency from 100 kHz to 100 MHz. Input voltage-2 mv minimum, unable to higher frequencies. Amplitude continuously variable via panel control.

INTERNAL MARKERS: Harmonic birdies at 1, 10 and 100 MHz Variable birdies from 100 kHz to 100 MHz. Marker accuracy-.005% for Harmonic; .02% for variable. Marker amplitude: approx. 0.1 V p/p.

FREQUENCY DRIFT: Less than 0.3% at 25°C; $+2^{\circ}\text{C}$ per 10 minute interval after 30 minute warmup on each band. .05-10 MHz Band: ± 10 kHz or $\pm 0.3\%$, whichever greater 1-300 MHz Band: ± 50 kHz or $\pm 0.3\%$, whichever greater 255-1200 MHz Band: $\pm 0.3\%$

SWEEP WIDTH (VARIABLE): 50 kHz-300 MHz: 10 kHz (min.) to 300 MHz (max.). 255 MHz-1200 MHz: 100 kHz (min.) to $> \pm 20\%$ of center frequency.

BLANKING: Switchable, vertical output returned to zero ref. level.

POWER: 115V $\pm 10\%$ 60 Hz 65W approx.

REPRESENTATIVES

AUSTRALIA

Technico Electronics Div.
Mars Road
P.O. Box 50
Lane Cove, N.S.W. 2066
Australia

DENMARK

Instrutek Aps.
41 Houannsgard
Dk 8700
Horsens, Denmark

ENGLAND

Wessex Electronics Ltd.
114-116 North Street
Downend, Bristol BS16 5SE
England

FRANCE

Electro-Liaison
113, rue de l'Universite
75007 Paris
France

GERMANY

Nucletron Vertriebs, GMBH
Gartnerstrasse 60
Munchen, West Germany

GREECE

American Technical Enterprises
P.O. Box 156
Athens, Greece

INDIA

Motwane Private Ltd.
127 Mahatma Gandhi Rd.
Bombay 400-023, India

ISRAEL

Elina Ltd.
35 Jabotinski Road
P.O. Box 4130
Ramat-Gan, Israel

ITALY

Vianello S.P.A.
Via Tommaso de Cazzaniga 9/16
1-120121
Milano, Italy

JAPAN

Marubun Corporation
1-1 Nihonbashi Odemmacho
2-Chome, Chuo-Ku
Tokyo 103, Japan

KOREA

Advanced Trading Co.
CPO Box 1616
Seoul, Korea

REPUBLIC OF CHINA

Shin Yu Electric Co., Ltd.
Yu Fang Building
No. 24 Chang Chun Road
Taipei, Taiwan, R.O.C.

SOUTH AFRICA

Joseph Teer & Son Pty., Ltd.
P.O. Box 1630
Johannesburg, South Africa

SWEDEN

Teleinstrument AB
P.O. Box 490
162 04 Vallingby, Sweden

THAILAND

General Equipment Co., Ltd.
G.P.O. Box 2198
Bangkok, Thailand

SOVIET UNION, CZECHOSLOVAKIA, POLAND, HUNGARY, ROMANIA, BULGARIA, YUGOSLAVIA

Medata AB
Oxenstierngatan
Stockholm, Sweden
5-115-27

KAY

Kay Elemetrics Corp
12 Maple Avenue
Pine Brook, NJ 07058 USA
(201) 227-2000
TWX: 710-734-4347